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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MASAAKI HIROKI, AKIRA MASE, and
SHUNPEI YAMAZAKI

Appeal 2008-0123
Application 08/372,899
Technology Center 2600

Decided: May 29, 2008

Before KENNETH W. HAIRSTON, MAHSHID D. SAADAT,
and ROBERT E. NAPPI, *Administrative Patent Judges*.

HAIRSTON, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from a final rejection of claims 21 to 31, 34, and 35. We have jurisdiction under 35 U.S.C. § 6(b).

We will reverse the rejections.

STATEMENT OF THE CASE

Appellants have invented an electro-optical device, and a method for driving an electro-optical device that includes a plurality of pixel electrodes and a thin-film transistor connected to each of the pixel electrodes. The method includes the steps of addressing each of the thin-film transistors with a scan signal for a predetermined period, in sequence, and supplying each of the pixel electrodes with a data signal through the corresponding thin-film transistor during the addressing with the scan signal. The predetermined period is time-divided into a predetermined number of divisions, and the data signal contains a plurality of pulses of a constant pulse width. The number of the pulses determines the tone of a displayed image. After the predetermined period to display the tone of the image, an average voltage of the plurality of pulses is applied to the corresponding one of the pixel electrodes (Figures 1 and 3; Specification 4 and 5).

Claim 21 is representative of the claims on appeal, and it reads as follows:

21. A driving method for an electro-optical device having a plurality of pixel electrodes, each of which has a light modulating layer and a thin film transistor connected thereto, said method comprising the steps of:

addressing said thin film transistor with a scan signal for a predetermined period, in sequence; and

supplying each of said pixel electrodes with a data signal through the corresponding thin film transistor during said addressing with said scan signal,

wherein said predetermined period is time-divided into a predetermined number of divisions, and said data signal contains a plurality

of pulses having a constant pulse width, the number of said pulses being determined depending upon a tone of an image to be displayed, and

wherein an average voltage of said pulses is applied to corresponding one of said pixel electrodes after said predetermined period to display said tone of said image.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Castleberry	US 4,873,516	Oct. 10, 1989
Kanayama	US 4,897,639	Jan. 30, 1990
Kondo	US 5,142,272	Aug. 25, 1992 (filed May 19, 1988)
Inaba	US 5,408,246	Apr. 18, 1995 (filed Feb. 21, 1990)
Kanatani	US 5,414,443	May 9, 1995 (filed Apr. 4, 1990)

The Examiner rejected claims 21 to 31 under 35 U.S.C. § 103(a) based upon the teachings of Inaba, Kanatani, and either Applicants' admitted prior art or Castleberry.

The Examiner rejected claim 34 under 35 U.S.C. § 103(a) based upon the teachings of Inaba, Kanatani, Applicants' admitted prior art or Castleberry, and Kondo.

The Examiner rejected claim 35 under 35 U.S.C. § 103(a) based upon the teachings of Inaba, Kanatani, Applicants' admitted prior art or Castleberry, Kondo, and Kanayama.

ISSUE

Appellants contend *inter alia* that the applied prior art neither teaches nor would have suggested to one of ordinary skill in the art a plurality of data signal pulses of constant width applied to pixel electrodes during a

predetermined scan period, and an average voltage of the pulses applied to a corresponding one of the pixel electrodes after the predetermined period to display the tone of an image (App. Br. 7 to 9). Thus, the issue before us is whether the applied prior art teaches or would have suggested to the skilled artisan applying a plurality of data signal pulses of constant width to pixel electrodes during a predetermined scan period, and applying an average voltage of the pulses to a corresponding one of the pixel electrodes after the predetermined period?

FINDINGS OF FACT

As indicated *supra*, Appellants' disclosed and claimed invention has data signal pulses of constant width that are applied during a predetermined scan period, and an average voltage of the pulses is applied to a corresponding one of the pixel electrodes after the predetermined period.

Inaba describes a passive electro-optical device that includes scanning electrodes 2a and data electrodes 2b to form a plurality of pixels (Figure 7; col. 7, ll. 33 to 47). Figure 9 of Inaba shows driving scan signals applied to three different scan lines during three different scan periods, and the drive waveforms applied to the data line during the scan periods (col. 7, ll. 61 to 67). Inaba states that "a driving mode for gradational display through pulse amplitude modulation was adopted, but the present invention is also applicable to other known driving modes wherein the pulse duration or pulse number is varied depending on given gradation data" (col. 8, ll. 4 to 9).

Kanatani describes an active electro-optical device that uses thin-film transistors (TFTs) 104 at each juncture of a scanning electrode 101 and a data electrode 102 (Figure 20; col. 1, ll. 23 to 55).

According to the Examiner, "Applicants' prior art teaches an average voltage which can be applied to a pixel electrode (see figure 11 and page 5, lines 21-27)" (Ans. 4).

The Examiner states (Ans. 4) that "Castleberry teaches a display system for applying an average data signal to a data line (column line) after a predetermined period (a certain number of row address times) (see figures 4, 5, 7 and column 6, lines 35-56)."

"Kondo teaches a display device comprising a display (20); a ROM (6) and a memory for storing gradation data (see figure 1; column 4, lines 45-61 and column 13, lines 33-36)" (Ans. 5).

"Kanayama teaches a method for a display device comprising a memory (11); a latch circuit (20); counters (PC1-PCN); a flip-flop circuits (FF1-FFn) (see figures 3, 4 and column 6, lines 10-43)" (Ans. 5).

PRINCIPLES OF LAW

The Examiner bears the initial burden of presenting a prima facie case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). If that burden is met, then the burden shifts to the Appellant to overcome the prima facie case with argument and/or evidence. *See Id.*

The Examiner's articulated reasoning in the rejection must possess a rational underpinning to support the legal conclusion of obviousness. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

ANALYSIS

Figure 9 of Inaba shows a scan signal applied to a scan line for a predetermined period, and a data signal applied to a pixel during that same

predetermined period. The data signal applied to the pixel during this predetermined period does not contain a plurality of pulses having a constant pulse width. In Inaba, the referenced teachings of pulse amplitude modulation, pulse duration, and pulse number are not pulses having a "constant pulse width" as set forth in claims 21 to 31 on appeal. Neither Kanatani, the admitted prior art, nor Castleberry discloses a data signal applied during a predetermined period that has a plurality of pulses of "a constant pulse width." With respect to the average voltage/data signal teachings of the admitted prior art and Castleberry, neither prior art teaching describes an "average voltage" of "a plurality of pulses having a constant pulse width" that is applied to pixel electrodes "after" the predetermined period as set forth in claims 21 to 31 on appeal. The ROM teachings of Kondo, and the latch circuit, the flip-flop circuit, and the counter teachings of Kanayama do not cure the noted shortcomings in the teachings of Inaba, Kanatani, the admitted prior art, and Castleberry.

CONCLUSION OF LAW

The Examiner has not established the obviousness of claims 21 to 31, 34, and 35.

ORDER

The obviousness rejections of claims 21 to 31, 34, and 35 are reversed.

REVERSED

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